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the Co-op Spirit

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...a computer cooperative

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THE CO-OP SPIRIT is the monthly newsletter of TechAlliance, a non-profit computer cooperative committed to providing members with resources that increase the understanding and enjoyment of personal computers. The co-op provides members with user groups for the Amiga, Apple // Family, Macintosh, and MS-DOS machines. Both beginning and advanced assistance are provided at our various Special Interest Group Meetings. The Kent, Washington office is presently being set up as a resource center for our local members. Members can peruse the software and book library. This newsletter is our official organ and is sent to every member. It consists mostly of contributions from the membership which include industry news, machine-specific articles, and other items of interest.

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MEETING SCHEDULE: Please see last pages of newsletter for meeting schedules and times.

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The TechAlliance BBS

9600 Baud Modem Online

With over 1,000 validated users, the TechAlliance BBS is one of our fastest growing services. Users find valuable technical material on this BBS, including discussions of basic and technical programming problems, viruses, and select postings from other online sources such as USENET.

The board's download libraries contain technical notes, sample code, and a collection of the usual fonts, utilities, stacks, etc.

Many of our current users are familiar with several computer environments, so crossover questions get good attention. And where possible, communication across computer types is encouraged. For example, the graphics library is largely in GIF format.

To sign on, simply call 206-251-0543. Our system uses standard modem parameters, 300-1200-2400+9600* baud, 8 bit, no parity, one stop bit. We have three phone lines with automatic roll-over connection to the next available line.

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Call For Articles!

TechAlliance is your co-op, and it takes member participation to make things happen. If you are a local member, take the time to attend local meetings, volunteer to help or do a demonstration or a review of hardware or software. If you are not in the Seattle area, become a consultant, or if you have something you think would be helpful or of interest to other members, submit your thoughts and articles to the Co-op Spirit at our regular address, care of the Co-op Spirit Editor. Letters to the Editor are also welcome. But don't forget to include both printed and disk copies of all submissions in ASCII format on a 3½" disk. Disks will not be returned to the author, so be sure to make an extra copy for yourself.

Remember...your contributions and efforts will make TechAlliance a valuable resource to all members! ▲

1991 Board Election Results

The Election results are in, which means we have a new Board of Directors. Bob Huelsdonk was re-elected. John Keithly and James Walley are new to the Board, replacing Robert Clardy and Walt Nelson. The ballots were counted on March 25, 1991 by the Tellers Committee, headed by Sam Vass. The following is a recap of the vote:

Bob Huelsdonk	26.3%	Merle Davis	18.9%
John Keithly	22.0%	Toby Allard	12.4%
James Walley	20.4%		

We want to thank Merle and Toby for their willingness to shoulder the responsibilities of the Co-op. Becoming a member of the Board of Directors is a huge responsibility that demands time, integrity, tenacity, wisdom and patience. We also want to wish our new Board ever renewing strength as they guide us in the rebuilding of the Co-op.

The first meeting of the new Board was held in our office on March 27th. Election of officers was postponed until all Board members could be present. ▲

The Editor

Zzzzzapp!

Jolted out of my early-morning sleep by the deafening buzz of an electrical arc, I knew at once something was badly wrong. I lunged toward the sound, which came from beneath my computer desk, taking in at a glance the ominous blue-white glare from my surge suppressor, and the cloud of black soot staining the wall behind it. I ripped the Mac's plug from the outlet as the arc died and an evil smell filled the room. After my heart had stopped pounding, I examined the remains of my surge suppressor. Looking at the charred interior of the case, I shuddered. If it had been made of plastic instead of steel, there probably would have been a fire. The MOVs (Metal Oxide Varistors) had been literally blown apart by the force of the surge; then, like a welder's rod, had arced across the bare wire leads. I thanked my lucky stars that the MOVs had done their job and saved my Mac, while wondering whether there wasn't a better way to protect equipment, a way that didn't involve an explosive failure of the components that did the protecting. I thought about the time, a couple of years back, when my Hayes Smartmodem had died during a thunderstorm, along with a couple of chips on my computer's motherboard. I had surge protection on the computer, but none on the telephone line. When lightning struck nearby, a spike came up the phone line, fried the modem, then continued up the serial cable to kill the line-driver chips in my computer. After that experience, I added a surge suppressor on my phone line, so I was completely protected. Or so I thought at the time. Now I know I was wrong. In fact, I now realize that the modem was probably killed by my surge suppressor. The MOVs which were supposed to protect my computer had done their job by shunting an incoming power-line surge onto the ground conductor, the same ground used by the modem as a signal ground reference. The result was a few thousand volts across the modem's inputs and a dead modem.

Everything You Know is Wrong. I want to make three main points in this article. First, the surge suppressor you own, if it's more than a year old, is probably not protecting your equipment, because its MOVs have degraded to the point of uselessness, and there's no practical way you can test this. Second, even if it's brand new, or uses expensive TransZorb devices instead of MOVs, it is designed to dump surge energy onto the ground conductor used as a reference by your modem, network connection or other serial device, thus endangering your peripherals or other networked computers even if it protects your own computer. Third, there is a new device which will protect your equipment over the long term, ten to twenty years, without endangering it. Before I tackle those three points and try to convince you that the conventional wisdom about surge suppressors is wrong, let me tell you where this information comes from.

Lightning Strikes in the Capitol The National Institute of Standards and Technology, in Washington, DC, has a section devoted to the study of power-line surges. The head of the group,Francois Martzloff, has been studying surges and other transient electrical phenomena for many years, resulting in ANSI/IEEE standards (C632.41-1980, if you're interested) defining commonly-encountered spikes and surges. A recent experiment, in which surges were artificially induced in the power wiring of an industrial building, yielded an unexpected result: suppressor-protected computers were undamaged, but serial printers connected to them were damaged by surges on the data input lines, not the power line. Where had these surges come from? Martzloff and his colleagues finally concluded that the data-line spikes which had damaged the printers had been created when the computers' surge suppressors shunted the excess electrical energy to the common ground conductor. The printers had been killed by the surge suppressors! Interestingly, the NIST team was not the first to arrive at this conclusion. A small New Jersey company, Zero Surge Inc., had been founded not long before by two engineers who set out to build a power conditioning device which would not dump excess energy to ground. We'll talk more about the Zero Surge device later ... but now let's consider my three major points.

The Mortality of MOVs A look at GE's "MOV Design Manual" reveals several interesting facts. First, MOVs don't begin to respond to a voltage spike until 10-40 nanoseconds. That may sound fast, but the typical spike described in the IEEE standard has a rise time of just 5 nanoseconds. That means an MOV can't react fast enough to stop the most common electrical spikes ... spikes the IEEE standard says can be expected many times a week in an average building! Second, MOVs wear out. Every little jolt shortens the lifetime of an MOV, until finally it fails to provide any protection. Those little jolts include the several-times-a-week spikes described in the IEEE standard. A recent article in the industry journal LAN Times (May 1990) says: "If your surge protectors have been in use for a while (six months is a reasonable time), the MOVs may be incapable of proper performance. Moreover, as the [MOV] ages, its clamping voltage decreases and it may begin a process called thermal runaway, which has resulted in fire". (Remember, I spent a long time scrubbing the soot off my walls after my surge suppressors burned up!) A dead MOV, more precisely, one which has deteriorated to the point where it offers no protection, can only be detected with expensive, sophisticated test gear. That ten-cent LED which glows so reassuringly on your present surge suppressor may make a good night light, but it tells little or nothing about whether your MOVs are really doing their job, or have gotten tired and given up. I've been shown several commercial surge suppressors (a Kensington MasterPiece, among others) which appeared fully functional, but provided no surge protection whatsoever! In short, MOVs provide inadequate protection; they wear out in the course of normal use, and they fail without warning, possibly posing a fire hazard. What About TransZorbs? I've always figured I was extra safe, because

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my Mac was plugged into an expensive power strip using TransZorbs instead of MOVs. TransZorbs (avalanche diodes) are semiconductor devices which respond faster than MOVs, and don't degrade with time. However, I've recently discovered that they have another problem: when a really big surge hits, they fail "open", so they can't divert the surge voltage, just when they're needed most! But that's minor. The real problem is this: just about all presently available surge suppressors, whether they use MOVs or TransZorbs, are wired to divert, or shunt, energy to ground. As the NIST researchers found, this almost guarantees contamination of data lines, resulting in garbled data at best, and fried equipment at worst. The same design flaw which cooked my Hayes modem and those printers in Washington is built into almost every surge suppressor made, from the cheapest to the most expensive. The LAN Times sums it up this way: "Networks should only employ surge protectors that do not shunt surges to ground. If (existing) power conditioning devices contaminate the reference ground by introducing surges, it may be wise to remove such devices from a network or to replace them with something better." Some people may think they're protected by the use of UPS (uninterruptible power supply)

equipment, which by definition is a 100% battery-fed system. But not only are UPS quite expensive, their inputs are protected by the same fifteen-cent MOVs the average surge suppressor. (The single exception, Abacus Controls, licenses its technology from Zero Surge, the small company I mentioned earlier.)

A Singular Solution. So how can you protect your expensive computer equipment? The LAN Times has this to say: "The ideal surge protector would be a circuit that presents a high impedance to the surge and a low impedance to the (normal) power wave, while protecting the integrity of the ground circuit. It should also contain no degrading components like MOVs." Such devices exist; they are made by Zero Surge, Inc. If I tell you that the Zero Surge units appear to be the only surge suppressors on the market which work properly, you'll have a right to be skeptical. After all, the power conditioning business is full of snake oil salesmen, each claiming that only his product is worth buying. Well, I don't

blame you. I was certainly skeptical at first. But after reading articles in LAN Times, PC Week and Power Quality magazines and talking with electrical engineers as well as the president of Zero Surge, I believe the Zero Surge protectors are the only ones which 1) will adequately protect equipment and 2) won't contaminate data lines by dumping surges onto the ground circuit. The Zero Surge unit differs in four fundamental ways from ordinary surge protectors:

1. It's a series circuit with zero response time. It intercepts fast for MOVs to divert.

2. It contains no MOVs or other sacrificial or degrading parts, and no components are overstressed by surges of unlimited current up to 6000 volts (the IEEE standard). Its service life is equal to the shelf life of its components, which is why Zero Surge warrants its products for 10 years, and thereafter offers to upgrade any unit to new condition at anytime for 20% of whatever the unit then sells for.

3. Critical for networks and modems (BBS and LAN users take note), Zero Surge does not use ground as a surge sink, but instead stores the surge energy temporarily, then slowly releases it to the neutral line. This preserves the integrity of the ground for its role as voltage reference by all dataline interconnections.

4. Zero Surge takes the sharp leading edges off surges and noise, eliminating their ability to couple into computer circuitry.

Zero Surge makes 2 sizes of surge interceptors, a 7.5 Amp model (list $149), which is right for those of us who don't have laser printers, and a 15 Amp model (list $199) for those who do. The 15 Amp unit is offered at a special price of $169 to user group members. (You won't be surprised to hear that I bought one!) Zero Surge president Wendell Laidley is a straight forward, soft-spoken man who emphasizes his desire to answer any and all questions about his product. His phone number is 201-766-4220 (fax number: 201-766-4144). Don't hesitate to call him. I'll give the LAN Times the final say 'If it doesn't have UL or CSA certification as a transient voltage surge suppression device, don't buy it. Look for the UL 1449 clamping voltage in the product literature. If the device has UL certification as a temporary power tap, it means that UL has a high opinion of it as an extension cord, not as a surge protector!" ▲

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COMMUNICATIONS BASICS

By Alan D. Applegate

New comers to the on-line world are immediately faced with a number of choices. These choices seem to absolutely require an immediate decision and too often, none of the options look familiar. When a caller first tries to download a file, the BBS or host system asks them to specify a file transfer protocol. File transfer protocols are simply software programs to transfer files from the BBS to the caller's machine or vice versa. They use various techniques to detect and correct errors in the transmission. While many new users agonize over the choice of protocol to download a file, in one sense it really doesn't matter. As long as the protocol the user tells the BBS he will use and the protocol he selects on his communications program are the same, the transfer will occur as advertised.

So why so many choices? If one is as good as another, why list ten different protocols to complicate the situation? Actually, each type of protocol has its own advantages and disadvantages. Just getting the job done by selecting identical protocols does not imply making the best use of your on-line time and resources. This month, we will cover a topic that confounds even seasoned telecommunications veterans: file transfer protocols, which I'll call simply "protocols". As the dictionary definition of "protocol" might suggest, file transfer protocols are simply a set of rules on exactly how a file will be transmitted point to point.

Protocols come into play when you initiate a file upload or download, to or from your computer and another computer or host. Different protocols have different characteristics, and as such, it's important to know how to pick the right protocol for the right circumstances. Picking the wrong one can waste both time and money.

Of all protocols currently in use by microcomputers, XMODEM is by far the most pervasive. Most other common protocols are

either direct variants of XMODEM, or are cousins to it, using the same basic theory to get the job done.

XMODEM was developed by Ward Christensen of Chicago in 1977 and was originally simply referred to as "the modem program" or MODEM. The protocol was developed to satisfy his personal need to communicate with his associates reliably. Christensen readily admits that it isn't the technical elegance of XMODEM that has made it so pervasive, but the fact that it was an early entry, that it was placed in the public domain immediately and was very easy to implement that caused it to "take off" as it did.

Although XMODEM is fairly mediocre by today's technical standards, it's the one protocol that is practically ubiquitous with communications applications. XMODEM and its derivatives work on a very simple principle. Data (usually a file of some sort) is broken into equal pieces. With XMODEM, each piece is 128 bytes in size. These pieces are called "packets" or "blocks" and are basically demarcation points used by the protocol. Blocks are sent one at a time, and the receiving end reconstructs an exact replica of the original file block by block until the transfer is complete.

Each block of data must be sent in perfect condition in order to properly rebuild the file on the receiving end. If a single byte is out of place or damaged by telephone line noise, the received file will not be an exact copy and—depending on the type of file—may well be useless.

It is this very problem that protocols attempt to correct. A mathematical algorithm is applied to all the bytes in the data block. The result is a number that is fairly unique to the particular block. In theory, if you change a single bit in a ingle byte of the data block and rerun the algorithm, you'll produce a different number. The calculated number is sent with the block during the transfer.

The receiving computer applies the same algorithm to the received data a block and compares the result to the check number that accompanied the block. If they match, it assumes the block was received intact, and sends an acknowledgement (called an ACK) which signals the sender to deliver the next block. If the results of the algorithm don't match, however, it assumes errors are contained in the block. Instead of sending an ACK, the receiver sends a non-acknowledgement (called a NAK) which signals the sender to redeliver the damaged block. This process continues again and again, until all the blocks of the file are delivered intact. As you can see, the process is really very simple at its core. All of the common protocols in use today use some variation on this basic theme.

XMODEM has been in use for well over a decade, but over time several shortcomings in XMODEM have been identified. Descendants of XMODEM have tried to correct many of its deficiencies and those of earlier descendants, with varying degrees of success.

Protocols as a group possess a set of basic features, with each protocol implementing a subset of them. No protocol to date contains all the features of the others. As a result, some protocols are better choices than others in different situations.

In my next column, I'll go a step further by detailing the properties of each protocol, and giving tips on which protocol to use under given conditions. Choosing the right protocol for the situation can save considerable time and money, where picking the wrong one is robbing you of both.

ERROR CORRECTION refers to a protocol's ability to correct transmission errors. The reason protocols were developed was to DETECT ERRORS in data transmission. Detecting errors is only one step; once detected, errors need to be corrected.

The DETECTION ALGORITHM used dictates how well transmission errors are detected. There are different algorithms that a protocol can use to make these detections. In order from least effective to most effective, the algorithms commonly in use today are 8-bit checksum, 16-bit CRC (Cyclic Redundancy Check) and 32- bit CRC. These various methods trade overall throughput and amount of data being sent by the modem for greater sensitivity to data errors. None are 100% flawless, but all provide some degree of protection.

Many protocols also have the ability to send file information (attributes) with the data itself. Different protocols that support this ability send varying amounts of information. For the purposes of this discussion, FILE INFORMATION refers to the ability to send the name of the file, as well as its original date and time stamp. EXACT FILE SIZE is an important feature of some protocols. Early protocols, such as XMODEM, rounded file sizes to the nearest block cutoff. If a file wasn't evenly divisible by the block size, the file was "padded" with Control-Z characters— enough of them to make the file cut off evenly at a block. Usually this doesn't cause problems, but some files must not have extraneous data at the end or they can't be used. Newer protocols send the exact file size with the file, so that the receiver can save it exactly as it was stored on the host machine.

BATCH TRANSFER refers to a protocol's ability to send multiple files in a single command or transaction. This allows you to designate multiple file names to download or upload all at once, saving considerable effort when several files need to be transmitted. All batch protocols send the file name at the beginning of the transfer, even if only one file is being sent.

SLIDING WINDOWS is a feature which helps compensate for delayed connections, such as satellite links and packet switching networks (like those you encounter with CompuServe and PC Pursuit). Many protocols, such as XMODEM, send a block of data and stop sending until an ACK or NAK is received. When significant delays occur in the link itself, this waiting can take considerable time. Sliding windows allow the ACKs or NAKs to trail behind the blocks they correspond to by a certain number of blocks (called the window size) without actually stopping to wait for them. SEAlink, one of the sliding window protocols, can trail up to six blocks behind. A SEAlink transmitter could be sending block 27 while it's receiving the ACK for a block as far back as block 21. This "elastic" quality yields much greater efficiency than a constant start, stop, start, stop approach.

STREAMING protocols are similar to sliding window protocols in that they don't wait for ACKs or NACKs. But instead of providing a window, streaming protocols just send data constantly, assuming it's being received fine unless informed otherwise. When a block isn't received properly, the receiver tells the transmitter (sends a NAK), otherwise, the receiver is "quiet" during the duration of the data transfer. This adds even more efficiency to the transfer, since data is moving in only one direction in most cases, without any wait cycles. Error correction is difficult or impossible, however, so such protocols work well only on error-free links.

The next element of protocols is BLOCK SIZE. Generally, block sizes are either small (e.g., 128 bytes) or large (e.g., 1024 bytes). Both have their advantages and disadvantages. Block size becomes an issue with modem speed. Small block protocols were designed in the days where 300 and 1200 bps modems were the norm. Such protocols sent their 128 bytes down the line, waited for a response, then sent more data. The ratio between data transmission time and idle time (waiting for an ACK or NAK) was appropriate in most cases.

When higher speed modems became available, small block protocols began to show a serious deficiency—they could spend more time waiting for an ACK or NAK than they did sending data. For this reason, large block protocols were developed and greater efficiency

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was achieved. Although small block protocols are still common, in most cases, you wouldn't want to use them above 1200 bps, unless they are sliding window protocols. At 9600 bps small block protocols are often unbearably slow.

Block size is important for another reason—line quality. When line quality is poor (i.e., there are numerous transmission errors) large block sizes can begin decreasing efficiency. If one single byte of data is damaged in transmission, the entire large block has to be resent. If there are several errors, more time can be spent resending bad data than sending new. Large blocks are therefore most efficient when line conditions are good. Small blocks on the other hand are the most efficient when line conditions are poor, since retransmission takes less time.

One relatively new and specialized feature is DYNAMIC PACKET (or BLOCK) SIZING. ZMODEM is currently the only protocol in common use which supports this. It attempts to compensate for the line noise versus line speed issue by dynamically varying the size of the blocks. The initial block size is generally modem speed dependent, and can be quite large (upwards of 8K bytes each). Midstream block size changes can be made if the number of errors increases during transmission, compensating for variable phone line conditions. Under the worst line conditions, the block size can end up being quite small (as little as 16 bytes). In theory, this means that the optimal block size is used at all times.

Another new feature pioneered by ZMODEM was FAILED TRANSFER RESTART, This handy feature means that if a file transfer was aborted for any reason (fatal line noise, operator error, etc.), rather than retransmit the whole file, the transfer process could pickup where it left off automatically. This capability is receiver driven, meaning that the receiving end of the transfer must implement the restart feature. When the original download is attempted over again, the receiver can signal the sender to pick-up from the exact byte offset where it left off.

SuperKERMIT, one of the first protocols to implement advanced features, possesses one unique characteristic—PACKET (or BLOCK) INSERTION. As discussed previously, some types of communications links have tremendous point-to-point delays. When a bad block is received, the receiver must signal the sender to resend the bad block. But with sliding window protocols (such as SuperKERMIT or SEAlink) the sender may well have sent several blocks before it even gets the signal that a bad block was received. All other protocols move back to the beginning of the bad block, and start resending over again from that point. If good blocks were received after the bad block, they're "dumped" entirely and resent after the bad block is resent, thereby wasting time. SuperKERMIT has the ability to resend only the bad block, then continue where it left off—"inserting" a resend of the bad block in the middle of everything else. This saves time and increases efficiency by not resending data that was already received in good condition.

Some protocols offer RLE (Run Length Encoding) DATA COMPRESSION. This means that an algorithm internal to the protocol actually compresses the data being sent over the line. This provides the same benefits as modem-based data compression and programs like ARC, PKZIP, and so on. Currently, few protocols offer this feature. SuperKERMIT and ZMODEM-90 (a special ZMODEM enhancement) are two such protocols.

Most files on your PC are composed entirely of 8-bit characters. In order for most protocols to send such files, an 8-bit data connection is necessary. Most all PC-to-PC connections use an 8-bit data path. For virtually all BBS connections, your communications program parameters are set to 8 data bits, No parity, and 1 stop bit (8N1). Some types of connections, particularly to mainframe computers or over some packet switching networks, only allow 7-bit bytes to pass. Many commercial on-line services require you to set your commparameters to 7 data bits, Even parity, and 1 stop bit (7E1). They use a 7-bit connection.

In order to send 8-bit files over a 7-bit connection, a protocol feature called 7-BIT TRANSPARENCY is required. Such a feature sends 7-bit characters as-is, but specially encodes 8-bit characters so they can be sent as 7-bit characters instead. This technique is also called 8TH-BIT QUOTING. The KERMIT protocol was developed by Columbia University to solve precisely this problem and is the first protocol to use such a technique; it is by far the most widely used protocol for use on 7-bit links. 7- bit transparency requires considerable overhead to operate, and can dramatically extend the transfer time of some types of files. It is almost never a good selection over an 8-bit path such as to a BBS, but to transfer files to a commercial service or the company mainframe, it's usually required.

I should note that some types of software used over 7-bit links employ a mechanism called DATA BIT SHIFTING, which allows the use of 8-bit protocols on a 7-bit link. Basically, when an 8-bit protocol is selected, the link itself shifts to 8-bit for the duration of the transfer, then shifts back down again once it's completed. Both the host and your terminal software must support this feature (many do) or the transfer will not be successful. Online services such as CompuServe, BIX and GEnie all employ this technique, which is why you can use protocols like XMODEM even though you dial in at 7-bits.

Another feature that works somewhat like 7-bit transparency is CONTROL CHARACTER AVOIDANCE. This means that the protocol will specially encode any control characters (ASCII 0 to 27) in the file being sent so that such characters aren't actually sent down the line. This is necessary on certain types of links because control characters may be used to control certain aspects of the connection. If they're sent as part of a file transfer, a connection could fail. Only specialized situations require this feature.

A feature very similar to control character avoidance is XON/XOFF AVOIDANCE. Software-based flow control works through the sending of two particular ASCII characters: Control-S (XON) and Control-Q (XOFF). On links that use XON/XOFF flow control, it would cause undesirable results if those characters were sent as part of a file transfer. With protocols that incorporate XON/XOFF avoidance (such as ZMODEM), those two characters are specially encoded so that they're never actually sent down the line if they exist in the file being transferred.

That ends part one of my two-part series on file transfer protocols. In my next column, I'll discuss each protocol in more detail, and offer my own suggestions for the best protocols to use in particular situations. ▲

Reprinted with permission from Jack Riccard of: BOARDWATCH Magazine, February,1991 issue, 5970 S. Vivian St., Littleton, CO 80127, (303) 973-6038.

NOTE: This fine article was typed in by Peter Barnes. He will present the second part next month, assuming he finds the next issue of the magazine at the local newsstand (i.e., Tower Books).

File Compression

By Kelly Petlig

How is it possible to put 1.2 Meg on your 880K floppy? Or how about 30 Meg on you 20 Meg hard drive? There are many ways, and most are in frequent use.

Have you ever had a program load, and shortly thereafter it flashes your pointer or maybe shakes the screen for a few seconds? More than likely it was packed, or compressed, only to be decompressed after loading. Why would someone do that? As you shall learn from this article, there are many reasons to pack something, not the least being saving disk space.

You've just found a great program that solved world hunger, but every time you load it, it says "could not load food.library v23.6". Reading the instructions (the last resort, of course!), you find that you have to copy food.library to your Workbench disk. Now comes the problem, there's no room. You've erased all your unnecessary utilities and commands, but still no room. It's just too bad that your Workbench's diskcopy program takes 17K instead of 10K, because then you easily fit that 5K library on the disk!

Now here's what you need to hear—it can and will. Diskcopy only takes 10K—when compressed! That's right, now you can have the power of all those hackers who manage to put 15 game demos on one boot disk, with a program called PowerPacker.

PowerPacker, by PowerPeak, will allow you to fit much more than 7K extra on a disk. I've seen some disks that have effectively doubled the programs on them. Who needs high density with this! The programmer Nico Francios, in Belgium, has many utilities out that support this shareware program which has gone commercial with v3.0. Some include PPMore and PPShow, which will show you PowerPacked text and pictures, respectively. PowerPacked commands such as diskcopy, don't need special loaders. They automatically unpack when loaded. This is where the flashing pointer comes in. PowerPacker allows the choice of color cycling the pointer, the whole screen, flash the power LED, or shake the screen when the program unpacks. Registration for PowerPacker is $20.

Now, after solving world hunger, you decide to write all your progress in your diary. How could you keep someone from simply reading that diary? Try PowerPacking it as a data file with encryption. It may not be national security safe, but it'll sure keep me from reading it. Just don't forget the password or you may never get the data back! The above also works for programs containing obvious data, but they're not password safe, only NewZap safe.

Imploder is another compression program I have seen, which even plays music while imploding (packing) programs and data. It touts being able to trick the AmigaDOS loader into loading imploded data and unpacking completely transparent to the user.

One thing PowerPacker or Imploder won't do is pack groups of files or whole directories into one file. Why would somebody want to do that? Let's say you want to give the program away in one easy to distribute file, documentation and all.*** All you need to do is LhArc it into one LZH file. If I just lost you, read on!

Long ago, back in the IBM days, a programmer realized he could compress massive programs down to a fraction of their size. This programmer also decided to compress many programs into a single file. Now he could pass around this single file that contained the program, data, and docs, when uncompressed. Bulletin board systems capitalized on this idea, after all, a 10 Meg hard drive could only hold so much. Fifteen Meg could now be pushed in this hard drive and no longer would somebody get the program without the docs. The catch? You can't actually run the programs until their uncompressed.

Not only does it take up less room on the old hard drive, but it also takes less time to download! The smaller the file, the less time it takes. It also keeps users from searching the same BBS for any associated files, they are all in the same file! How can it get much better?

Let's improve on the idea. Not only can we compress 50% more data on a disk, but we can compress up to 150% more data on the disk, and keep the subdirectories needed within the file. We can do this with newer compression methods. The older ones were called Zoo, Arc, Pak, Warp etc. Now we have LhArc, Zip, LhWarp, DMS, and Zoom to contend with. Why so many? Isn't there just a 'better' version, and all the old ones outdated?

Next (article/month/time) we will get a clue on how these work and how to make them work for you. ▲

*** *Editors Note: TechAlliance assumes the Author is referring to legally distributable files and documents.*

AMIGA TIP

By Peter A. Barnes, AMIGAlliance Chairman

If you, like me, have an Amiga 2000 which you have upgraded from having two 3-1/2 inch floppy drives to having one floppy and a 3-1/2 inch hard drive, you now have one internal 3-1/2 inch floppy drive for which you no longer have room in your computer's case. Well, dust off that extra floppy! For a mere $13.13, I purchased the necessary connectors and footage of ribbon cables (Radar Electric, 168 Western Ave. W., Seattle, WA 98119, phone 206/282-2511). I then constructed the cables necessary to connect to the internal drive connectors (there is one for the drive data and one for the drive power). The two cables now snake out of an available slot in the back of my computer and connect to the extra floppy which now sits on top of my A2000's case. It has magically been transformed from an internal to an external floppy. It works just fine and I now have gotten my "df1:" device back! ▲

Peter may be contacted for details.

"The Apple IIGS: What the Mac LC Should Have Been?"

by Roger Wagner

A review of the Mac LC in the December, 1990 issue of inCider magazine was subtitled "What the Apple IIGS Should Have Been?" The underlying idea was reasonable: If the Mac LC had been introduced in 1986, rather than the IIGS, people would most likely have been fairly happy with this transition machinez to the Mac. However, history does not accommodate "what ifs", and at this point, one can legitimately ask, "Is the Apple IIGS what the Mac LC should have been?"

The unexpected factor today is the world of multimedia, and that the Apple IIGS is arguably the ideal multimedia (or hypermedia) machine. Regardless of what term you use, this environment will be more significant in the 90's than desktop publishing was in the 80's, particularly in the classroom.

The ideal multimedia machine should have good color graphics, excellent sound, and the ability to connect to laserdiscs, CD-ROM, and VCRs. It should be easy and intuitive to use, and as affordable as possible. You should be able to present your work, and easily record and transport it to share with others. The Apple IIGS has all this and more.

Let's suppose a student creates a multimedia report, and then presents it to the class. With the Apple IIGS, a standard classroom monitor or TV can be used with no special hardware. Although a TV isn't great for displaying 80-column text screens, multimedia presentations with graphics, larger text, and video sequences from a laserdisc will look quite nice. On a Mac or PC, a projection system that can handle true color is likely to cost $2000-$3000, or more.

Laserdiscs, combined with a video overlay card, add a very attractive component, and allow anyone to create very exciting results. On the Apple IIGS, a school can buy a Video Overlay Card for about $400. On the Mac LC (if a card were available), using the slot for a video card would preclude using the IIe card. Cards similar to the Video Overlay Card on other Mac models cost around $2500. (By the way, services are now available that will convert your own videotapes to a laserdisc for $200-$300!)

On its way to that TV or monitor, the Apple IIGS video can be routed through any common VCR, recording both the audio and video portions of the presentation, so Mom and Dad can see what they did at school, and keep a permanent record of the moment. Presenters can go to conferences with just a video tape, without lugging tons of computer hardware. Macs and PCs require a special adapter (an "NTSC Converter"), and these can be an expensive addition.

You heard it here first: The VCR will be the printer of the 90's. How else to record sound, animation, graphics, video and more, and in a form that anyone can view (virtually all homes and schools now have VCRs). Once you're aware of what the GS can do, hearing that another computer can't be recorded with a VCR is like hearing it can't be attached to a printer. An article in the October 15, 1990 issue of BusinessWeek discusses Apple's generation of computers AFTER the Mac: "At least two years off, Jaguar will include extensive video technology and the ability to connect to TVs and VCRs, Apple employees say." How great for Apple IIGS owners to know that they don't have to wait for the successor to the Mac. They can have all this now!

Schools that purchase Mac LC's, hoping for a color multimedia machine, will be surprised to discover that HyperCard on the Mac is only black & white. A limited ability to display single color graphics is available, but to just draw a line or two in color, you'll need a GS with HyperCard or HyperStudio. Want to use the microphone on the LC? You'll have to leave HyperCard, run a separate program, and then go through some additional steps to incorporate the sound. On a GS with HyperStudio, adding sound is easy and perfectly integrated into the overall environment.

Last of all is the working environment itself. Stackbuilding on the GS is significantly easier. Thousands of schools are using the Apple IIGS for multimedia right now, and projects created entirely by 1st graders are by no means unusual. Home users of the Apple IIGS find it perfect for not only the kids, but fun for personal-interest uses from family trees to hobby-related projects. Through user groups, mail-order catalogs, and online services like America Online, CompuServe and GEnie, there are already almost 200 megabytes of existing hypermedia applications (stacks) of every imaginable kind - all for the Apple IIGS.

What does the future hold for the Apple IIGS? The Apple IIGS is not an outdated technology. The Apple IIGS has features that are not currently available in any machine, and offers a solution that couldn't be more relevant to the next revolution in computing. I've personally travelled extensively across the U.S. in the last year, and everywhere I've seen a tremendous amount of interest and enthusiasm for what the Apple IIGS offers. This interest is the result of recognizing a practical and immediate tool. If you haven't yet seen what multimedia and the Apple IIGS are all about, there couldn't be a better time than now to find out what the future holds, and how you can make that future a present reality. If you already have an Apple IIGS, then you'll be happy to know you own the best machine possible to enter the 90's! ▲

From a letter to inCider/A+ magazine, March, 1991. Permission is hereby given by the author to anyone wishing to reprint this letter. Please include this permission statement with any reprints.

By Bill Cowell

Previously I mentioned that you could use a standard VGA monitor with a MAC LC. The March 11th issue of InfoWorld gives the actual pinout connections if you want to build your own cable. If you buy a NEC 2A or 3D monitor, NEC will give you a free cable. There is a 2.01 update to Word Perfect for the Mac, which adds four import/export conversions for other word processor applications. Apple is planning several additional products for this year and later. This includes a Mac Classic II, a notebook version and something called a Home Companion(?). ▲

Backing Up With 4DOS

By Steve Cavanaugh

One of the things I haven't been very religious about is backing up my files, so this week I initiated the task of setting up a backup scheme. At first I looked at PC Tools version 6, but I couldn't seem to get it to work the way I wanted. It compresses the files, but it only seems to want to work on one drive at a time, forcing you to initiate the procedure for each drive. That would have been fine, but I wanted all my backups to go to a 20 Meg. Bernoulli drive, and PC Tools only allows one backup file per media. All that compression is useless if you can only have one 700K byte file on a 20Meg media.

Next I tried PKZIP. I'm a real fan of the PK utilities; so much so that I've ordered copies for all the people in my department. PKZIP can look at the files in an existing .zip file and the files on your drive and update only the ones that have changed. That's perfect! All of my data files have unique extensions: .doc for WinWord; .mpp for WinProject; .xls for Excel; etc. That means I can easily set up a batch file that hunts for those file types and performs the backup. Unfortunately, if you invoke PKZIP and there are no files of the type specified, PKZIP quits with an error message. The result is that when you set up a batch file to zip your data files by using *.ext, PKZIP will usually give up before the batch file plays out. Pity.

Having my files compressed when I back up would be nice, but with a 20Meg media to back up to, it's not absolutely neccessary. I remembered that 4Dos has several commands that can interrogate the file archive attribute, so I decided to pursue that avenue.

First, I set up a batch file called backup2.bat that looks like this:

```
echo off
global xcopy *.doc m: /S /M
global xcopy *.mpp m: /S /M
global xcopy *.xls m: /S /M
```

The 4Dos global command executes a command in the current directory and it's subdirectories. Using the global command like this assures that every subdirectory on the current drive will be checked for files with .doc, .mpp, and .xls, as long as I change to the root directory first. I've chosen to use the xcopy command because xcopy has two characteristics I want: the /S switch copies the subdirectory structure when it finds a file that matches the filespec, and the /M switch causes xcopy to copy files whose archive flag is on and then turns the archive flag off. The archive flag is only turned back on if the file gets modified.

Next, I set up a second batch file called backup1.bat that looks like this:

```
c:
cd\
call backup2.bat
d:
cd\
call backup2.bat
e:
call backup2.bat
```

The 4Dos call command allows you to call a second batch file as a subroutine. I chose to use this method so that I can control which drives are affected by my backup procedures, independent of the core backup routine. Since most of my actual data files are on drive D: I can revise backup1.bat to only affect D:, or I can include all of my drives simply by modifying backup1.bat.

One of the problems with this method is that there are a lot of files that have the same extension as the files I'm interested in backing up. When I ran it the first time, I found that all of the Excel sample files were backed up, as well as every text file and document file. I don't really need a backup of 4dos.doc, so I went into the backup drive and removed all of the files I didn't want. Since the archive bit

continued on page 10..

BITS & BYTES

By Bill Cowell

4DOS...

continued from Page 9...

was set when they were copied, the next time I use this procedure they won't be re-copied.

The other problem with this method is that many setups don't have a 20Meg Bernoulli to back up to. There are two potential solutions to this problem. The first is to split backup2.bat into several batch files, one for each type of file. If the number of files you are backing up is small (and this will normally be the case if you do it frequently) you may be able to get them all on one floppy disk. The second solution is to back up in two steps. The first step moves the files of interest to another hard disk drive, and the second step copies the files to floppies. This method requires that some space be set aside on your hard drive for this purpose. One other solution that I've used effectively when backing up to floppy disks is to use Fill.com. Fill.com copies files to the floppy disk starting with the largest file, and working down to the smallest. Fill.com has the unique attribute that when the destination disk is full, it prompts for a disk change, and then continues from there. Fill.com also has a switch that will interrogate the archive flag on a file.

There are hundreds of ways to back up your data files. For my existing setup the ones discussed, although a compromise, work effectively to keep important files safeguarded. You may choose to use these, or you may find an alternate method. Whatever the method, if you aren't presently backing up your data, you are asking for major trouble down the road. ▲

DOS 5.0 - I don't mean the yet to be released Microsoft 5.0. There is a real live operating system with the 5.0 designation that has been out since last fall. What's more it has all the enhancements promised by Microsoft. I heard that Microsoft was in the front row when it was announced taking notes on what should be in their update. Currently DR DOS is the only operating system that can provide you up to 620k of base memory to run your programs. All the reviews that I have seen have been quite favorable. Of course, the big thing is, it is available now. I thought the original price of $199 was on the high side. I think they have finally learned from Borland, that if they really want to compete with Microsoft, they had to lower the price. This they have done. It now lists for $79. If you want improved memory management, enhanced command capability, and reduced use of your precious base memory get a copy of DR DOS.

I have just loaded DR DOS on to my system. For an old time DOS user it takes a little getting use to. If you have a more or less customized autoexec and config.sys file, you will probably have to make some modifications to make best use of DR DOS. One of the nice features of the system is the ability to select just what you want to use out of your autoexec while the system is booting. By adding a ? in front of the autoexec command, you are given the choice of whether to execute that command for this session or skip it. The installation is quite simple, if you accept the default options. I didn't, so I have autoexec and config.sys files that are probably not optimum. I chose to keep my old files and they now contain a mixture of old and new boot commands. I have already had to relocate my command line for Directory Scanner (my favorite HD manager) in order to be able to use it. The operating system offers a real mixture of goodies for everyone from the new computer user to the old time DOS hacker.

For the new user, the DOS shell called ViewMax will allow use of the computer with little or no direct interface with the less than helpful DOS prompt and command environment. The shell isn't as fancy as Windows or PC-Geos, but is certainly easier to use than Windows. It provides a split screen, each half of which can show the directories/files of a different disk drive. You can select files in either window using either the keyboard or a mouse. You can then read, start a program, move a file, etc. with just a few key strokes or mouse clicks. Files can be shown as icons, text or as part of your directory tree. For the advanced user there is a whole family of additional DOS commands that let you really manage your system. It also includes a full screen editor, password protection, an advanced debugging tool and even documentation that is readable and includes examples.

HARDWARE UPDATE - It's hard to believe how fast hardware prices have dropped in the last few months. I usually price out a system about once a week, and almost every time the cost is lower than the previous week. With AMD now into the market with their version of the 386 chip, you can expect the prices to continue to drop. I can hardly wait until AMD comes out with a low cost coprocessor for the 386 machines. If you have a 286 machine you should jump at the chance to get their $99 coprocessor for an AT. The only exception to lower hardware costs is RAM chips. Four MB chips are still coming down, but one MB chips have bottomed out and in fact are creeping up almost daily. The last time I priced them they were up about 10% from their low. I have had two distributors tell me that they are going up at about 2% per week.

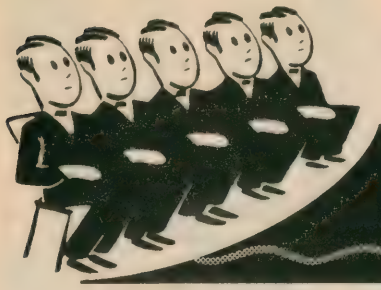
Hard Drives have shown enormous improvements and very rapid decreases in price over the last few months. Fairly high speed

40MB units, including controller, are now about $225. Larger units are even more of a bargain. As of the end of March, 130MB, 19ms (average access time), units have been available for about $435. The hot selling drives now are the IDE units. These units are easy to install since they come low level formatted. In addition to better average access times, they also have exceptionally fast data transfer rates. You must have at least an AT type machine though, since they require a 16 bit bus interface. There are other good options though, for even those with XT's. If you don't have a drive bay available you can use a hard card such as the Hardcard Plus units. These are installed in a single expansion slot. In the past these excellent units were quite expensive, but with recent drops in price the 80MB unit now lists for only $499.

Modems are another area that have shown significant improvements and lower costs. Good internal 2400 baud units are available for less than $80. Every month I get several calls on modems. The main question is what to buy. For average home use, a basic 2400 baud unit is quite adequate. Its probably not worth spending the extra money for a speed higher than this, or even one with MNP. All the BBSs support at least 2400 baud and a few are starting to show up with 9600 baud access. The 9600 baud rate is nice for transferring large files, but for just interfacing with a BBS, a 2400 is more than adequate. The modem is usually waiting for your input anyhow. MNP units do offer better error handling and file compression. The latter can give you the equivalent of a 4800 baud rate. The MNP compression normally doesn't help when you are downloading from a BBS, since their files are already compressed. In fact using MNP can sometimes even slow down the transfer of a previously compressed file. Whether you should get an internal or external model is mostly a matter of personal choice. The external units are more or less portable. They can be used with more than one machine. The disadvantage is that you will have to put up with the extra hardware and cabling that are required for these units. They are also slightly higher in cost. The next question is usually, why does a unit like the US Robotics cost more than a unit like the Cardinal. The answer is mainly related to quality and ability to handle line noise. In the Seattle area, most phone lines are relatively low noise, so a Cardinal is perfectly adequate. I don't know of anyone who has had a problem with one of them.

DISK CACHE - If you don't have one get one. Preferably not the one that comes with Windows 3.0. The one that comes with Windows is better than none, but there are several that are much better and are not dependent on Windows. The one that comes with DR DOS is one option. I have just installed PC-Kwik on both my laptop and 386 machines. There is a dramatic improvement in hard drive performance on the 386 machine. The 386 has a hardware cache, but the addition of software cache set up by PC-Kwik, still showed a 600 percent improvement in hard drive transfers. This result is based on the PC-Kwik benchmark test. The test consists of a series of test files being written and read from the hard disk. On my 386, the total time for this combination of tests showed a drop from about 57 seconds to less that 10 seconds after installing PC-Kwik. My laptop is an 8088 with 1 MB of RAM. On it the improvement wasn't nearly as dramatic. The big benefit on a XT is suppose to be when you are accessing a floppy disk. I haven't tried a floppy disk performance test, so I am just repeating Multisoft's claim. Improvements on a AT machine will also be good. You can buy just the cache program, which lists at $80, or the PC-Kwik Power Pak which lists at $130. The Power Pak includes a printer spooler and other utility programs as well as the cache program. I would guess that those using a 286 machine with over 1 MB of memory would get the most noticeable improvement. If you are more or less satisfied with your 286 machine, but are wishing your disk operations were a little faster, PC-Kwik could save you from an expensive hardware upgrade.

PRODIGY UPDATE - They keep adding things to the service. One unannounced (at least I didn't see it) addition is the InfoWorld product ratings. Use HARDWAREGUIDE as the jump word to take a look at the latest from InfoWorld. ▲



Board Briefs

MARCH 27, 1991

This board meeting, held at TechAlliance Offices was called to order at 6:40 pm, March 27, 1991.

Walt Nelson, former President, called the meeting to order.

Also present:

Anthony Fortini, Vice-President
Dave DeGroot, Treasurer
Sharon Farquhar, Secretary
Bob Huelsdonk, Re-elected Director
Dick Hubert, Director
James Walley, Newly elected Director

Absent:

John Keithly, Newly elected Director

Walt Nelson introduced James Walley to the Board. A few minutes were spent relaying the election results. Sam Vass will keep the ballots for approximately 6 months and then dispose of them.

Walt Nelson was thanked for serving as President and then he turned the meeting over to Anthony Fortini, Vice-President.

Dave DeGroot made a motion to table the election of officers until the next regular meeting. Bob Huelsdonk seconded and it passed unanimously.

Finances:

Anthony Fortini brought up a concern about getting the finance information the night of the meeting. He would like to have the finances from the CPA a week before the Board Meeting and considered it a high priority.

It was decided by the next meeting we will come up with any possible cuts in our budget. In addition, a budget will be prepared with costs estimated for continued staff and costs estimated without staff.

Dave DeGroot suggested that we continue to pay the CPA firm until the end of March and have the firm do the corporate tax return.

Minutes:

Bob Huelsdonk made the motion to approve the Minutes of the Special Meeting of 2/25/91. Dick Hubert seconded. 5 members approved - 1 member (James Walley) abstained.

Miscellaneous:

Dave DeGroot made a motion to pay Anthony Fortini for the mileage he requested. Dick Hubert seconded. 4 votes "for" - 2 votes abstained (Sharon Farquhar, Anthony Fortini)

Renewals:

Renewals have not been sent out yet. Dave DeGroot stated that he felt renewals should not go out until we have a firm plan on how to continue the organization. The BOD made the decision to send renewals out by April 10, 1991.

Member Services:

Newsletter

The issue was raised whether we want to continue the newsletter on a monthly basis. James Walley made the motion to continue the newsletter on a monthly basis. Bob Huelsdonk seconded it. It was voted on, and the results were 5 votes in favor and 1 (Dave DeGroot) vote opposed. Dave advocated that the newsletter be published every other month.

Anthony Fortini mentioned that he knew of 2 companies interested in advertising in our newsletter. He indicated that he felt we should run ads to help offset the expense.

Special Interest Groups:

James Walley suggested that a cost estimate from each SIG leader plus a written justification should be required prior to upgrading or purchasing any new equipment. The BOD was in agreement with his suggestion. James also mentioned that if the SIGS want special equipment or upgrades that might be a project for individual SIGs to accomplish, and in doing so, increase the enthusiasm in that SIG.

Member Roster:

Dave DeGroot made a motion that we should disseminate a roster to the members, but a form must be filled out to have the name put in the roster. Bob Huelsdonk seconded. The motion passed unanimously.

VAC:

Dave DeGroot reported on the discussion that took place at the VAC meeting. The members indicated some options to consider if we wind the club down:

1. Continue to make equipment available to SIGs
2. Sell the equipment to SIG leaders with a signed obligation to continue to act as SIG Chairman for a specified period of time
3. SIGs would retain no equipment
4. Make provisions to continue the BBS

The Board requested that Dave DeGroot take back the following message to the VAC. TechAlliance is not dead, but we must make some changes to stay viable.

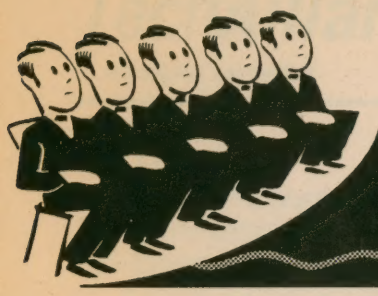
Office Asset Policy

Bob Huelsdonk made a motion for a policy that before any assets may be removed or copied, the request must be made in writing and approved by the Executive Officer or BOD. Dave DeGroot seconded the motion. Anthony Fortini made a friendly amendment that if a person violates those rules, disciplinary action will be taken. Bob Huelsdonk seconded the amendment. It passed unanimously.

Bob Huelsdonk also made the motion that any equipment to be used on the premises must be approved in advance by the Executive Officer. Dave DeGroot second. Motion passed unanimously.

The remainder of the meeting was spent in executive session.

Meeting adjourned at 10:45 pm. ▲



Meeting Briefs

AMIGALLIANCE

March 13, 1991

March's AMIGAlliance meeting started off with a presentation of the animation/ multimedia demonstration video tape which Commodore had shown at the recent VideoGraphics seminar. (Anyone who wants a copy of this impressive tape should present Dick Homas with a blank video tape and ask nicely). NOTE: If you want an eyeful of the Amiga's superior capabilities, you should take a look at this tape!

Peter Barnes finished off the evening with a hands-on preview of the latest Commodore 64 Emulator: The A64 Package by Questronix. This is the best of the 64 emulators so far. (A C64 emulator, if you are not familiar with the concept, is an Amiga application which allows software written for Commodore's earlier C64 computer to run on an Amiga computer). The company licenses the software portion of the package to you for $25 (plus $3 shipping equals $28), BUT in return for your money, Questronix will send you the hardware interface that allows you to hook up your old C64 disk drives to your Amiga. This is necessary to take full advantage of the A64 Package since loading C64 programs from Amiga disk drives has many limitations, probably the greatest of which is the fact that Amiga drives cannot normally read C64-format disks. A utility such as Central Coast Software's Disk-to-Disk may be used in some cases to transfer files from C64 disks to Amiga disks (an Amiga 5-1/4-inch drive is required), but copy protection schemes commonly rely on reading certain information from the brains of the C64 drive. Amiga drives do not have brains, so the copy protection techniques usually stop the transferred program files from running correctly under the emulator.

Finally, the usual discussions and announcements developed and the evening was topped off with a little copying (Public Domain and Shareware only, of course).

Peter A. Barnes, AMIGAlliance Chairman

MS-DOS SIG

March 26, 1991

Bill Cowell, of Cowell Computers, demonstrated PC GEOS. It appears to be an excellent program and runs on XT systems without a problem. Some computer enthusiasts believe that it is what Windows should have been. It has an extremely efficient memory management system.and uses much less memory than Microsoft Windows. PC GEOS sells for $199.

If you missed the March meeting, please try to join us in April. I am sure you will enjoy yourself.

Sharon Farquhar, MS-DOS Chairmain ▲

May 1991 Special Interest Group Meeting Information

AMIGALLIANCE

This will be showing off new versions night. We'll look at SuperBase 4, CanDO 1.5, and another program if it arrives in time for our meeting. Hope to see you all there.

APPLE II FAMILY

A representative or two from Zip Technology, in Culver City, CA, will be on hand to demo, and sell at a considerable discount, each of their several models of accelerator cards for the IIGS. Prototype models of their new memory cards and internal hard drives will also be shown. Bring your checkbook or plastic to take advantage of the specially discounted prices.

Thanks to Mike Staats for setting this up.

MAC SIG

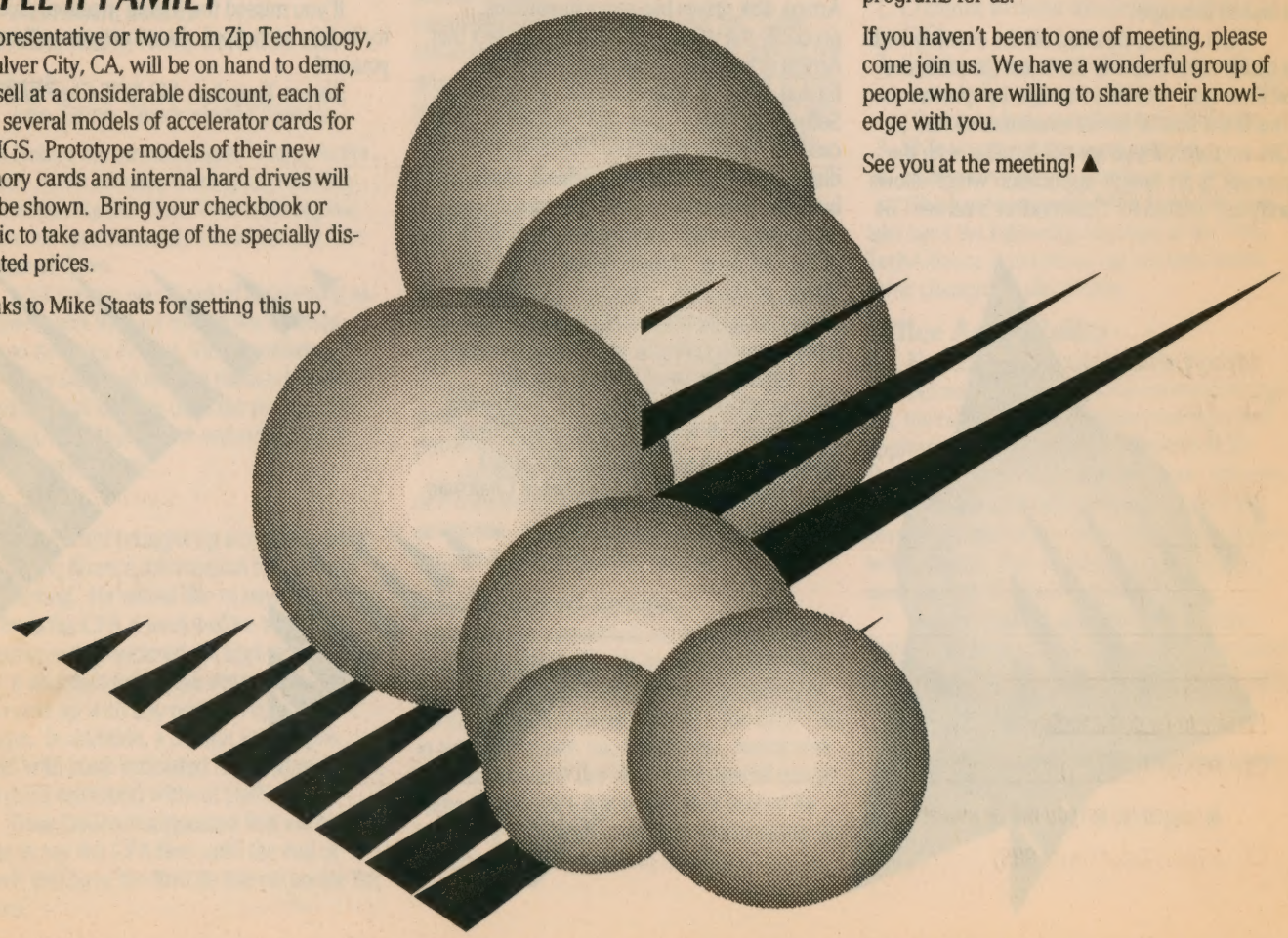
Details were not confirmed by press time. Dave usually plans an interesting meeting, so come on down. I'm sure most of you could plan great meetings, too. Why don't you offer Dave a helping hand. All SIG leaders appreciate helping hands.

MS-DOS

This month we are tentatively planning a demonstration by Prodigy. However, as of the printing of the newsletter it has not been confirmed. In the event that we cannot get the Prodigy demonstration firmed up, Steve Cavanaugh, will demonstrate some shareware programs for us.

If you haven't been to one of meeting, please come join us. We have a wonderful group of people.who are willing to share their knowledge with you.

See you at the meeting! ▲



TechAlliance

. . . a computer cooperative

19309 - 68th Ave S., #R-109, Kent, WA 98032

Please complete and mail entire form

Dear Member,

We are in the process of creating a membership directory and member-to-member consulting network. If you are interested in participating in this directory and/or member consulting, please fil l out the form below and mail it to TechAlliance, 19309 68th Ave. S, Kent, WA 98032.

If you have received a renewal form recently and have already filled out this information, please do not send in a duplicate form.

Thank you in advance for your participation in TechAlliance.

Member Services

Member Directory Form

I use the following systems:

❑ Apple II/+/c ❑ Apple IIGS ❑ Amiga ❑ Mac ❑ MS-DOS
❑ Windows ❑ UNIX ❑ OS-2 ❑ Other _____

➧ Please "x" each data box below that you want included in the Member Directory. Only those areas marked will be published.

Include in Directory Data: (**Database corrections** for Directory and future mailings - see current database info on label)

❑ Name _____

❑ Address _____

❑ City, State, Zip+4 _____

❑ Phone Number (_____) _____ - _____

❑ I do not want to be listed in the Member Directory at this time.

Member-to-Member Consulting Network Form

❑ **Yes**, I am interested in joining our Member-to-Member Consulting Network and will consult as indicated below: (B)eginning level users; (I)ntermediate level users; (A)dvanced level users.

System	Specific Software or Hardware Knowledge (List in priority)	Mark Appropriate Boxes
_____	_____	❑ B ❑ I ❑ A
_____	_____	❑ B ❑ I ❑ A
_____	_____	❑ B ❑ I ❑ A
_____	_____	❑ B ❑ I ❑ A

I prefer to be contacted by:

❑ Phone: (_____) _____ - _____ Time Zone _____

Days and hours you will be available: _____

❑ E-mail (TechAlliance BBS) ❑ E-mail (other) _____

TechAlliance Application for Membership or Renewal

Yes! Sign me up for one year's membership in TechAlliance for $25.
(International memberships are $35.)

Name _____ Daytime Phone _____

Address _____ Home Phone _____

_____

City _____ State _____ Zip _____

☐ Check Enclosed ☐ New Membership

☐ Charge my bank card (VISA or MasterCard) ☐ Renewal

Card Number _____ Expiration Date _____

Signature _____

CS0591

May Meeting Schedule

***Advance sign-up required for these meetings.*

Tue., May 7nd:	Beginners Help Session - 7:00 p.m. IIGS (& II Family) SIG - 7:30 p.m.
Wed., May 8th:	Amiga New User Class - 6:30 p.m.** AMIGAlliance - 7:30 p.m.
Sat., May 11th:	Amiga New User Class - 10:00 a.m.**
Tue., May14th:	Mac Help Session - 6:45 p.m. Mac SIG meeting - 7:30 p.m.
Wed., May 15th:	Mac Programmers SIG - 7:00 p.m.
Tue., May 21th:	Voluntary Advisory Comm. 7:00 p.m.
Tue., May 28rd:	MS-DOS Beginner's Corner - 6:30 p.m. MS-DOS SIG meeting - 7:00 p.m.
Tue June 4th:	IIGS Beginners Session - 7:00 p.m. IIGS (& II Family) SIG - 7:30 p.m.
Meeting Location:	All meetings are held at the office unless otherwise specified.

TechAlliance™
...a computer cooperative
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Kent, WA 98032

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